while maintaining the impedance. Further, because a conductive ratio of the second conductive layer **130** may be adjusted by the plurality of dummy patterns **132**, warpage of the circuit board may also be controlled.

[0114] Similarly, as long as the plurality of dummy patterns **132** do not interfere with an overall layout of the ground line **131** described above, a layout, a shape, a width, an interval, or the like of the dummy pattern **132** is not particularly limited. For example, referring to FIG. **12**, a continuous dummy pattern **132** is disposed between the respective intervals of the ground line **131**. However, referring to FIG. **13**, a plurality of dummy patterns **132** are disposed between the respective intervals of the ground line **131**.

[0115] Similarly, the plurality of dummy patterns **132** may include at least one material selected from silver (Ag), palladium (Pd), aluminum (Al), nickel (Ni), titanium (Ti), gold (Au), copper (Cu), platinum (Pt), and the like having excellent conductivity, or a mixture of at least two materials thereof. The dummy pattern **132** may be formed by a known method, such as electro copper plating, electroless copper plating, or the like. According to an example, the dummy pattern **132** may be formed using a method such as a chemical vapor deposition (CVD) method, a physical vapor deposition (PVD) method, a sputtering method, a subtractive method, an additive method, a semi-additive process (SAP), a modified semi-additive process (MSAP), or the like, but the method of obtaining the dummy pattern **132** is not limited thereto.

[0116] Although FIGS. **5** through **13** illustrate various examples of the second conductive layer **120**, the above-mentioned illustrations are not applied to only the second conductive layer **120**, but may also be applied to the third conductive layer **150**. That is, a ground line of the third conductive layer **150** may also be a conductive path in which a plurality of conductive patterns are connected to each other to form a meander shape, and may have an area in which the signal line **121** is provided. In addition, unit patterns having an opened curve shape or opened bracket shape may be disposed on an edge portion of the ground line, and inner unit patterns having an obliquely inclined shape, obliquely inclined shapes arranged in a zigzag shape, or a curved wave shape, may be disposed between the outer unit patterns having the opened curve shape or opened bracket shape disposed along the edge portion. The above-mentioned unit patterns may be connected to each other to form return paths for a variety of signals transferred through the signal line **121**. That is, to significantly reduce a difference of values of characteristic impedances for each of positions of the signal line while maintaining high characteristic impedance, the ground line **131** may be patterned, for example, in an oblique meander shape or other repetitive shape. In addition, the third conductive layer **150** may also include dummy patterns of various shapes, and for example, a plurality of dummy patterns which are not connected to the ground line may be disposed between the intervals of the ground line. An additional detailed description refers to the contents described with respect to FIGS. **5** through **13**.

[0117] FIG. **14** schematically illustrates a signal return path RP of the ground line **131** patterned in an oblique meander shape. Referring to FIG. **14**, because the signal return path RP of the ground line **131** patterned in the oblique meander shape is meanderingly moved in a diagonal line direction along one path, the signal return path RP may have a path longer than the signal line **121**. Further, the return path RP includes several portions in which the ground line passes across the signal line **121** in a plan view of the circuit board. The current directions **151**, **152** of the ground line as the ground line passes across the signal line **121** alternate toward two different sides of the signal line **121**. In the example illustrated in FIG. **14**, the inner conductive patterns include obliquely inclined stripes that are arranged parallel to each other. The current direction **151** in an obliquely inclined stripe is opposite to the current direction **152** in an adjacent obliquely inclined stripe such that the current directions **151**, **152** form a 180 degree angle with respect to each other.

[0118] As noted above, in accordance with the trend for producing slender electronic products, the thickness of the insulating layer may be reduced, thereby making it difficult to maintain the characteristic impedance of a circuit board. As such, in a case in which the signal return path RP is implemented to be longer, since a compensation for an impedance decrease caused by the decrease in the thickness of the insulating layer is possible, the characteristic impedance of the circuit board may be more effectively maintained.

[0119] FIG. **15** schematically illustrates a signal return path RP of a ground surface **431** patterned in a fill shape. Referring to FIG. **15**, the signal return path RP of the ground surface **431** patterned in the fill shape may be moved along various paths. As a result, it may be difficult to control the signal return path RP. Further, because the ground surface **431** patterned in the fill shape has the signal return path RP shorter than the ground line **131** patterned in the oblique meander shape, a compensation for an impedance decrease caused by the decrease in the thickness of the insulating layer is expected to be insufficient to produce a circuit board having the desired impedance.

[0120] FIG. **16** schematically illustrates a signal return path RP of a ground line **531** patterned in a hatch shape. Referring to FIG. **16**, the signal return path RP of the ground line **531** patterned in the hatch shape may also be moved along various paths. As a result, it may be difficult to control the signal return path RP. Further, because the ground line **531** patterned in the hatch shape may have the signal return path RP longer than the ground surface **431** patterned in the fill shape, but may have the signal return path RP shorter than the ground line **131** patterned in the oblique meander shape, a compensation for an impedance decrease caused by the decrease in the thickness of the insulating layer is expected to be insufficient in comparison to the ground line **131** patterned in the oblique meander shape illustrated in FIG. **14**.

[0121] FIG. **17** schematically illustrates a corresponding relationship for each positions of the signal line of the ground line patterned in an oblique meander shape and the ground line patterned in the hatch shape. In this example, "the corresponding relationship for each of the positions" of the signal line may be determined in relation to "a case in which the signal lines are disposed in parallel with each other". Referring to FIG. **17**, it may be seen that the ground line patterned in the oblique meander shape has corresponding pattern shapes which are constantly maintained in any case of a position **1** and a position **2** of the signal line. In addition, referring to FIGS. **14** and **17**, it may be seen that the corresponding return path is constantly maintained in any case of the position **1** and the position **2** of the signal